vals, if with blue they were totally blue, and so of the other Colours. And when they were illuminated with any one Colour, the Squares of their Diameters measured between their most luminous parts, were in the arithmetical progression of the numbers 0, 1, 2, 3, 4, and the Squares of the Diameters of their dark intervals in the progression of the intermediate numbers $\frac{1}{2}$, $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$: But if the Colour was varied they varied their magnitude. In the red they were largest, in the indico and violet least, and in the intermediate Colours yellow, green and blue; they were of several intermediate bignesses answering to the Colour, that is, greater in yellow than in green, and greater in green than in blue. And hence I knew that when the Speculum was illuminated with white Light, the red and yellow on the outside of the Rings were produced by the least refrangible rays, and the blue and violet by the most refrangible, and that the Colours of each Ring spread into the Colours of the neighbouring Rings on either side, after the manner explained in the first and second Part of this Book, and by mixing diluted one another so that they could not be distinguished, unless near the center where they were least mixed. For in this Observation I could see the Rings more distinctly, and to a greater number than before, being able in the yellow Light to number eight or nine of them, besides a faint shadow of a tenth. To satisfy my self how much the Colours of the several Rings spread into one another, I measured the Diameters of the second and third Rings, and found them when made by the confine of the red and orange to be the same Diameters when made by the confine of blue and indico, as 9 to 8, or thereabouts. For it was hard

to



to determine this proportion accurately. Also the Circles made successively by the red, yellow and green, differed more from one another than those made successively by the green, blue and indico. For the Circle made by the violet was too dark to be seen. To carry on the computation, Let us therefore suppose that the differences of the Diameters of the Circles made by the outmost red, the confine of red and orange, the confine of orange and yellow, the confine of yellow and green, the confine of green and blue, the confine of blue and indico, the confine of indico and violet, and outmost violet, are in proportion as the differences of the lengths of a Monochord which sound the tones in an Eight; *sol, la, fa, sol, la, mi, fa, sol*, that is, as the numbers $\frac{1}{9}$, $\frac{1}{18}$, $\frac{1}{12}$, $\frac{1}{12}$, $\frac{2}{27}$, $\frac{1}{27}$, $\frac{1}{18}$. And if the Diameter of the Circle made by the confine of red and orange be 9 A, and that of the Circle made by the confine of blue and indico be 8 A as above, their difference 9 A ---- 8 A will be to the difference of the Diameters of the Circles made by the outmost red, and by the confine of red and orange, as $\frac{1}{18}+\frac{1}{12}+\frac{1}{12}+\frac{2}{27}$ to $\frac{1}{9}$, that is as $\frac{8}{27}$ to $\frac{1}{9}$ or 8 to 3, and to the difference of the Circles made by the outmost violet, and by the confine of blue and indico, as $\frac{1}{18}+\frac{1}{12}+\frac{1}{12}+\frac{2}{27}$ to $\frac{1}{27}+\frac{1}{18}$, that is, as $\frac{8}{27}$ to $\frac{5}{54}$, or as 16 to 5. And therefore these differences will be $\frac{3}{8}$ A and $\frac{5}{16}$ A. Add the first to 9 A and subduct the last from 8 A, and you will have the Diameters of the Circles made by the least and most refrangible rays $\frac{75}{8}$ A and $\frac{61\frac{1}{2}}{8}$ A. These Diameters are therefore to one another as 75 to $61\frac{1}{2}$ or 50 to 41, and their Squares as 2500 to 1681, that is, as 3 to 2 very nearly. Which proportion differs not much from the proportion of the Diameters of the

Circles.